

Personal Information

Black n' Red®

Name

Dale Johnson

Dates of use

Evaporation Rate Study Notes

If found please contact

Guide to book contents

Important contact details

Use this page as a quick reference to the book's contents during use and for archiving purposes.

www.BlacknRed.com



A John Dickinson product

6/29/09

Mix of 20 ml of similar mixture to original CW w/ruffin

Start 20 ml total qty

12% oil leave 17.6 ml of solvent

59% benzene = 1 ml \Rightarrow 16.6 ml of solvent less benzene

1 ml benzen	$\frac{1.0}{6.7} = 1.50$ factor
2.4 ml oil	159. Toluene
2.5 ml Tol	129. Ethyl benzene
2.0 ml Ethyl benzene	67. p-xylene
1.0 ml p-xylene	167. m-xylene
2.7 ml m-xylene	37. o-xylene
0.5 ml o-xylene delete	307. cyclohexane
5 ml cyclohexane	189. Methylcyclohexane
<u>3 ml methylcyclohexane</u>	
<u>20,10 ml in mixture</u>	
<u>2.44 \approx 5 sec pnm</u>	27.0 °F liquid 28.5 F plate
2:45	27.5 °F liquid 27.0 Air temp
2:46	76.5 deg / 78.5 plate
2:47	75.5 °F deg 78.5 plate
2:48	78.5 deg 78.0 "

	<u>L10</u>	<u>G155</u>
2:49	74.5	78.5
2:50	74	78.5
2:51	73.5	78.5
2:52	73.5	78.0
2:54	73.5	78.5
2:55	73.5	78.5
2:58	73.5	78.0
3:04	73.5	77.5
3:11	74.5	77.5

Observation after solvents evaporated - oil left a
sheen on the glass in the pattern of the original
liquid spread. This will make quantifying surface
area difficult after initial pour.

6/8/09 Velocity Verification

~~up~~ stream

air velocity 2' x 2' duct

	1	26	27	31	28		6.5	6.75	7.75	7.0	
2	30	34	32	27			7.5	8.5	8.0	6.75	
3	24	34	31	23			6	8.5	7.25	5.75	= 108.75
4	13	30	25	20			3.25	7.5	6.25	5.0	cfm

D C B A

~~down~~ stream

9.5" x 8.5" duct

1	205	220	215		11.42	12.26	11.99				
2	220	225	220		12.26	12.54	12.26				107.01
3	200	210	205		11.15	11.57	11.99				cfm

C B A

Dial in

3	23	30	31	30							
4	24	28	29	30							

28

- 29 30 30

248-344-1770 add Jeff Cooper
Tim Fields
Bureau Veritas - Lab results on bulk liquid 6/8/09

GC-FID

cyclohexane 197,000 mg/kg

benzene 42,800 mg/kg

density .777

toluene 100,000 mg/kg

By mass benzene

$$R_{eff} \quad 668.1 \text{ ml} \times .777 \text{ g/ml} = 519.1 \text{ g}$$

$$OD \quad 80.0 \text{ ml} \times .863 \text{ g/ml} = \underline{69.0 \text{ g}} \\ 588.1 \text{ g}$$

$$31.9 \text{ ml} \times .929 \text{ g/ml}$$

6/8/09

Final mix for original LW formulation

Lab analysis - previous page 30 ml mix		Now mix
Benzene	3.5 ml	31.9 ml
Toluene	8.3 ml	55.3 ml
Ethyl benzene	8.0 ml	53.3 ml
p-xylene	4.0 ml	27.7 ml
m-xylene	11.0 ml	73.3 ml
o-xylene	2.0 ml	13.3 ml
cyclohexane	20.0 ml	133.3 ml
methyl cyclohexane	12.0 ml	80.0 ml
raffinate from P	30 ml	<u>200 ml</u>
	multiplied value by $\frac{200}{30}$	669.1 ml
$669.1 \text{ ml} \times 0.777 \text{ g/ml} = 519.1 \text{ g}$	+ 81.0 ml oil	<u>749.1 ml</u>

88% of ~~mix~~ mix w/o raffinate

$$\cancel{88\%} \frac{519.1 \text{ g}}{88} = 589.9 \text{ g}$$

$$589.9 \text{ g} - 519.1 \text{ g} \approx 70.8 \text{ g oil / actual added } 69.9 \text{ g}$$

$$\text{Benzene by volume sat. } \frac{31.9 \text{ ml}}{749.1 \text{ ml}} \times 100 = 4.3\%$$

6/8/09

Mixed raffinate w/oil for 2 minutes

Filled 14 - 40 ml vials with exactly 20 ml of L.W.

using 20 ml calibrated pipette. Lid is teflon/glass

Balance of liquid wrench formula - poured into 2 liter glass
jar.

Labeled bottles

"Liquid Wrench Reform"

Returned back to office - placed all mixed chemical
products in refrigerator.

6/9/09 Tested Windex in dust on glass while sampling.

No interference on ChemSense 600 data collection.

6/9/09 Mixed up test trials in vials

Benzene (1ml), Toluene (2.5ml)

Ethylbenzene (2.0ml), p-Xylene (1.0ml), m-Xylene (2.7ml)

Toluene (2.5ml), Ethylbenzene (2.0ml), p-Xylene (1.0ml), m-Xylene (2.7ml)

cyclohexane (5.0ml), methylcyclohexane (3 ml), oil (2.4ml)

6/9/09 - Sent 300 ml of CW reform to Penruco + Brown for analysis of liquid initial boiling point, Flash point closed cup, and specific gravity.

6/9/09 - Sent 20ml of CW reform to Bureau Veritas for analysis of primary compounds in liquid in weight percentage.

6/10/09 Conducting a mass balance run for benzene using mixture of: ethyl benzene (7.0 ml)
m-xylene (9.0 ml)
benzene (5.0 ml)

Flow rate:	31	31	26	22	1	Avg 29.5 fpm
(ft/min)	28	31	32	32	2	$29.5 \text{ fpm} \times 4 \text{ ft}^2 =$
	34	34	33	33	3	$118 \text{ ft}^2/\text{min}$
	28	28	24	25	4	
	D	C	B	A		

$$5 \text{ ml} \times 8.79 \text{ g/ml} = 43.95 \text{ g} \times \frac{1000 \text{ mg}}{2} = 4395 \text{ mg}$$

4173 mg measured on ChemSense 600

$$\frac{4173 \text{ mg}}{4395 \text{ mg}} \times 100 = 95\% \text{ capture (slight residue)}$$

6/14/09 Mixed up 1 ml benzene
19 ml cyclohexane

11	23	18	11	1
32	31	31	10	2 5.94
33	30	29	32	3
36	34	29	25	9
D	C	B	B	

6/14/09
Mixed up 3 ml cyclohexane 1:1
3 ml benzene

15	18	16	17	1
27	31	32	21	2 26.19
33	29	28	32	3
31	30	25	34	4
D	C	B	B	

Adenauer split
prop-one side means
only 72-71, overall
hydrocarbons.

Mixed up 6 ml cyclohexane 3:1
2 ml benzene

6/11/09

mixed up 9 ml cyclohexene 9:1
1 ml benzene

6/14/09

6 ml benzene

3 ml cyclohexene

31	25	21	21	1
30	30	29	29	2
21	30	31	22	3
31	30	32	22	4

D C B A

6/14/09

19,5 ml cyclohexane

0,5 ml benzene

22	27	26	18
29	28	25	25
31	31	30	13
14	29	38	23

251

end of oil residue no support to quantity benzene in oil.

Town Fields 248-344-1762

EPA 8260

7/1/09

Removed the three 40ml vials of residual oil that was scraped from the glass plate from the refrigerator where they had been stored.

These vials contained the remaining oil on the glass plate after completion of the evaporation trial.

They were packed in blue via inside a playmate cooler with a 1" insulation foam board fitted tightly around the top of the cooler & taped in place.

The vials were shipped to EMSL in N. J. overnight for delivery next day by 10:30 am.

Personal Information

Black n' Red

Name: Adam Keil

Dates of use 5/27/2009 -

If found please contact adkeil@gmail.com

Guide to book contents

griffith chemSense setup, calibration,
use for measurement of gas phase
benzene during benzene
evaporation rate study

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A John Dickinson product

EPI00103

5/27

Unrated 600 (chemSense)

- no damage
- installed unit + power cord

Powered up

- AC booted fine
- no toluene cal. gas warming when starting
GSS (won't use it anyway,
likely)
- installed cal. gas anyway
for h. trial fine

Unpacked benzene cal. + diluent

q.s cyl. headers

221 L air

103 L benzene, 5 ppm in air

data file 40 - 2 m.h direct leak
room air blank
biggest m/z 78 peak at
ca. 100 counts

data file 41 room air blank for sorbent
tubes

seems to be some high m/z noise.
both files, will likely subside
as unit pumps down

file 42 room air blanks, m/z
50-150 w/ 2 tubes

a hacked heat tape to shielded
stainless inlet - set controller
to $\sim 20 \pm 2\%$

P.L. 43 - 2 tube method
w/ heat tape @ ~ 75°C
- no apparent benzene
coming off filter.

backed heat tape controller
down to 15%

P.L. 44 2 min direct leak
w/ sintered stainless filter
at ~ 85°C

backed heat tape to ~ 10%

P.L. 45 is 2 min DL
filter @ 91°C

heat tape to ~ 8% ~~filter~~^{AC}

needle valve/regulator combinations
seem to work well
can control diluent
air from 3 L/min to
100 mL/min w/ needle
valve & regulator set to
3 L/min.

air cyl. reg set to 6.9 L/min
needle valve all the way open
500 mL 22.22 s

file 46 2 min DL (50-425)
dil. air cyl.

file 47 tube method (50-425)
dil. air cyl.

aha! am using tubing I just had
prev. run 5 ppm benzene
there... do I see it?

file 48 6mL DL run

first 2 mL, sucking
from vent (benzene
cyl. OFF)

open 2 mL, turned on benzene
(0.9 L/mL)

@ 4 mL, turned off benzene
cyl.

@ 4.2 mL, unhooked benzene
line from T

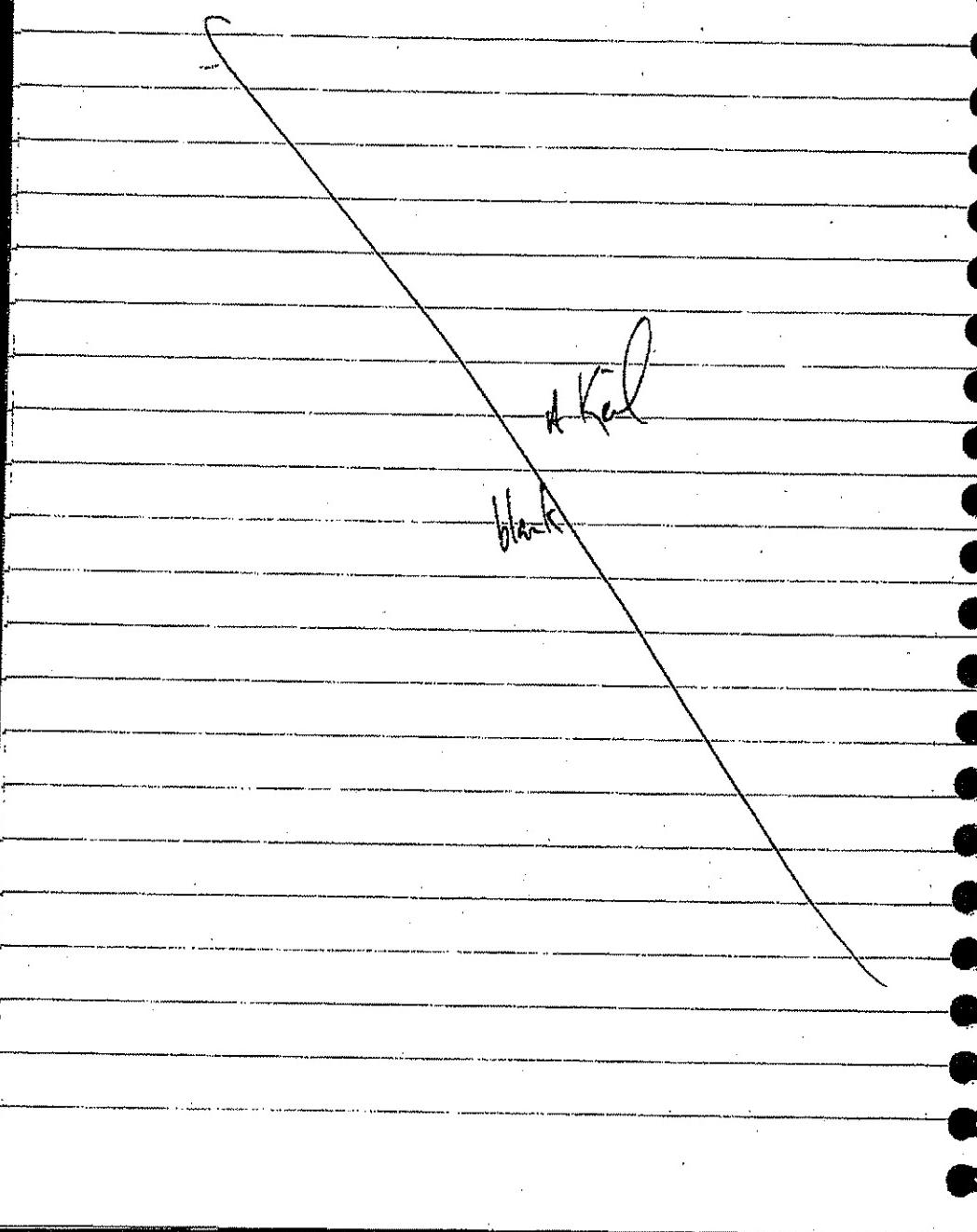
@ 4.6 mL, plugged openings < T
w/ fibers

@ 5.1 mL, removed fibers

file 49 DL method 50-150

1.6 mL, connected flowing
benzene line to T

w/ 28 cc left, disconnected T



EPI00109

AK
5/29 5/28

file 50 6ml DL 50-150
room air blank

shattered
stainless
weather
cold

file 51 6ml DL 50-150
flow box blank

file 52 6ml DL 50-150
flow box blank
hot inlet P.T. after ~90°C

file 53 6ml DL room air
hot inlet

file 54 single tube, 30 s sample T2
room air blank

file 55 same as 54, but tube 1 (T1)

file 56 2 tubes
dual alt tubes method
room air blank

AKL

Setup 5/28 AK

files 57, 58, 59, 60

dual alt tubes, meth

repeated 4 times,

room air

61 - DL, 60 mL

room air until ^{AK} until

2.0 mL, when I conn. 5 ppm benzene

to the T

@ 4.0 mL, dis conn. the benzene

file 62 ms only, detailed data,

DL no baseline substr.

room air until 2.5 mL,

when I attached 5 ppm benzene to T

removed @ 4.0 mL

dilutant air cyl.

0.5 Lpm setting, needle valve wide

open, gives 500 mL /n 27.34, 27.66,

27.52 S

AKel

AK
5/29 5/28

0.9 LPM setting gives 500 mL
L 16.91s, 16.54s, 16.60s

0.3 LPM setting

500 mL L 45.71s, 44.82, 45.34

5 ppm benzene cyl.

0.3 LPM setting

needle valve open

500 mL L 45.38s, 45.28, 45.51

needle 2 turns open

500 mL L 47.58

½ turn open ~500 mL L 122.88s

10 mL L 4.53 s, 4.63s, 4.56s

all these 500 mL times are to the 500 mL
label, not the real mark so need
to be consistent here, real volume
displaced is ~250 mL, but if
consistent for both gas streams I'm
ok

A/K

5/28

file 63 DL, 2 mL

1.346 ppm benzene

122.07 mL/min 5 ppm benzene

331.2 mL/min ^{AK} air

file 64 DL, 2 mL

0.597 ppm benzene

122.07 mL/min benzene

899.28 mL/min air

file 65, ^{AK} 66, 67, 68, 70

0.597 ppm benzene, as above

using dual alt tube method

file 65 does not exist

file 70 2 mL DL blank

cyl. air

file 71 2 mL DL

2.49 ppm benzene

330 mL/min 5 ppm benzene

331 mL/min air

A. Keil

5/28

72-75 2mL DL

cyl. blank

710-79 0.54467 ppm benzene

2 tube alt. method

110.4 mL/min 5 ppm benzene

899.28 mL/min air

80-83

0.8416 ppm

2 tube alt method

110.4 mL/min benzene

545.45 mL/min air

84-87

1.2499 ppm

2 tube alt method

110.4 mL/min benzene

331 mL/min air

A. Kail

AK 5/28
88-94 99

2 tube
cyl. blanks

100 - 111

2 tube
cyl. blanks

112 - 115

2 tube
5 ppm benzene

116 - 135 2 tube

room air blanks

136 - 145 2 tube blanks

146 DL 2 mL

room air blank

147 DL room air blank

AKel

"flow apparatus" = GBTEC

5/28

148 4 mL DL

sampling 'Blank' flow
apparatus prior to ^{AK}
EtOH/benzene, toluene, xylene mixture.

- 1/10 L of toluene (m/e 91) .L

this one - is it in my inlet manifold
somehow?

this was prior to putting in the
large glass slide

149 30 mL DL run

AK using "flow apparatus" of ^{AK}
Sampling from - a mixture of toluene,
ethyl benzene, and xylene
(generally equal parts, maybe a 6:7
more toluene) 25 mL total

~12 mL toluene, 7-8 mL of others
spotted onto large glass plate

150 60 mL DL of same sample

as 149, directly (or 1 or 2 mL off)

of the 149
removed inlet from GBTEC @ ^{AK} ca. 12 min.

5/29

swagelok part nos.

SS 1/4" nut

825-402-1 (1)

set of ten, SS ferrule pairs, 1/4"

S-400 - SET

GR

set nut + ferrule set, they may
multiples of 5

A/KG

AK
5/30 5/29

file 082654-1 is Zn.L DL

room air blank

some slight signal for toluene, still

is it the PFA inlet line?

this is w/o filter heater on

turned inlet heater on, shooting for 90°C

file 2 room air blank DL

w/ filter heater w/ (90°C)

file 3 DL Zn.L

position 2B (middle) on she

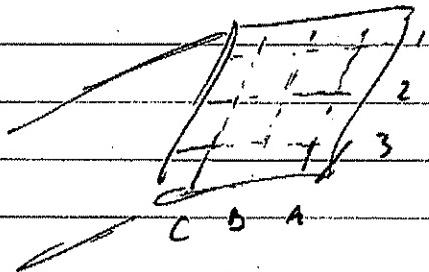
GATEC BLANK (no solvent poured)

In the test, I'll pour ethyl benzene into a
plate (to get constant surface area) & measure
signal of ^{AK} ~9 points to get an
idea of any differences in cross sectional

AK

8/29

concentration gradient



file 4 is a blank for position 3C

file 5 is 1C blank

file 6 is 2D blank

file 7 is 1A blank

file 8 is 2A blank

file 9 is 3A blank

file 10 is 3B blank

After

5/09

file 11 is 2C blank

anemometer flow check

2A - 205

2B - 215-220

2C - 205-210

1A - 200

1B - 200

1C - 196-198

3A - 195-200

3B - 198-200

3C 182-189

file 12 AL 90 min (may stop early)

ethyl benzene in the plate for
cross-sectional conc. difference

t = 0 min blank

t = 1:43 opened bottle in glove box, poured

t = 1:53 pouring done, bottle capped

t = 305 finally got hands out of gloves

at t = 6, inlet in position 2B

Aker

5/9

$t = 12:00$ moved inlet to 2C

$t = 14:00$ moved to 2A

$t = 16:00$ moved inlet to 3A

$t = 18:00$ inlet to 3B

$t = 20:00$ to 3C

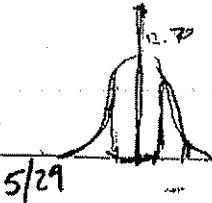
$t = 22:00$ to 1C

$t = 25:00$ moved to 1B

$t = 27:00$ inlet to 1A

$t = 41:00$ removed inlet from GBTEC

W.D.



5/29

File 13 5 mL DL of ethyl benzene
in GBTEC w/ 25 scans
per average

File 14 5 mL DL eth. benz. in
GBTEC, 25 scans per ave.,
no baseline substr. (shift/centro. I
data, though)

File 15 eth. benz by DL
5 scan ave., baseline substr. OFF

File 16 junk

File 17 began with sampling the
ethyl benzene in GBTEC
@ 2.0 mL, removed inlet from GBTEC
@ 3 minutes, connected inlet
to 5 μm flowing benzene
Benzene has much less variance &
the signal

Akel

5/29

File 18 GBTEC sampling while
Dale is using the flow unit
as of a fume hood to mix
(cetyl benzene plate is still in
there, too)

File 19 is continuation of 18,
after some delay.

File 20 continues file 19

17.3

File 21

Dale's test mixture in GBTEC
cap off 38 s
poured by

W.L.
Hig

6/8

file 22 GBTEC "blank", 2 ml ΔL

try to do 6/9:

benzene by itself - 1 ml

benzene + toluene - same quantities
as in LN mock test

mock LN (same as 5/29) w/o benzene

6/9

file 1 room air blank w/ sintered starch less
filter at $\sim 50^\circ\text{C}$ (warming up)

file 2 same as 1, filter at 60°C

file 3 same, filter $\sim 68^\circ\text{C}$

file 4 cyl air blank (2 ml ΔL) filter at
 $\sim 75^\circ\text{C}$ - air @ 0.7 LPM using
regulator, needle valve full
open

Akil

6/9
wts HK

file 5 - same as 4

file 6 - same as 4

file 7 5 ppm benzene from cyl. (flow set to 0.9 Lpm w/ needle wide open)
filter at ~88°C by now - steady

file 8 is same as 7

file 9 is same

benzene cyl flow (set to 0.3 Lpm @ reg.)

time to 500mL mark 45.69 s

45.66 s

45.81 s

air cyl. set to 1.2

time to 500mL mark 12.69

12.75

12.42

file 10 ~1 ppm benzene

1.086 ppm

HK

6/8 6/9 AK

f.t.c 11 1.086 ppm

f.t.c 12 "

f.t.c 13 "

f.t.c 14 cyl. blank

f.t.c 15 "

f.t.c 16 "

benzene cyl. to 0.7

+tbe to 500 mL mark 26.84

26.84

26.79

f.t.c 17 benzene 0.7 LPM, air 1.2 LPM

=> 1.893 ppm benzene

f.t.c 18 1.893 ppm benzene

f.t.c 19 "

tweaked needle valve on benzene

(reg. @ 0.3 LPM) to get & lower flow

+tbe to 500 mL mark 159.97

158.752 AK

2:08.01

A/K

left off AK

:13
:09

$\Rightarrow 0.479877 \text{ ppm}$

Pile 20 is 0.4799 ppm

Pile 21 "

Pile 22 "

Pile 23 junk

Pile 24 GBTEC sampling

while Dale uses it as a fume hood
for mixing

Pile 25

1 mL benzene in GBTEC

90 mL DL pile (many stops early)

began data collection w/ capped vial

in glove box

cap off @ 1:47

poured @ 1:51

mass balance
for benzene
looks good!

40 mL of data

Akil

~~start~~

4/8 4/9 AM

file 26

cyl. blank

file 27

cyl. blank

file 28

watched GBTEC sampling as
it's used as a hood

file 29 junk

GBTEC sampling, but wanted restart

file 30

benzene (1mL) + toluene (2.5 mL toluene)

cap off @ 1:47

pour @ 1:51

flow through GBTEC was high for
this run -

measured to be @

@ B2

4.3 ppm

@ glovebox

Akai

6/18 G/A AK

file 31 cyl. air blank

w/o cyl. on \oplus

file 32 cyl.
junk

file 33 cyl. air blank

file 34 ethyl benzene + xylenes xylene \oplus
in G/BTEC

first 2/10 sec are room air

cap off @ 1:47

pour @ 1:51

(same quantities as LW Mock mixture)

file 35 is junk

file 35 ^{3ea AK} same mixture as last file (5/2a)

LW Mock mixture

open ^{AK} pour @ 1:47

pour @ 1:53

more benzene
for benzene
is low

108 ft^3/min
 $3.19 \text{ mg}/\text{m}^3 = 1 \text{ ppm } \text{C}_6\text{H}_6$

Akai

off 6/9 AK

36

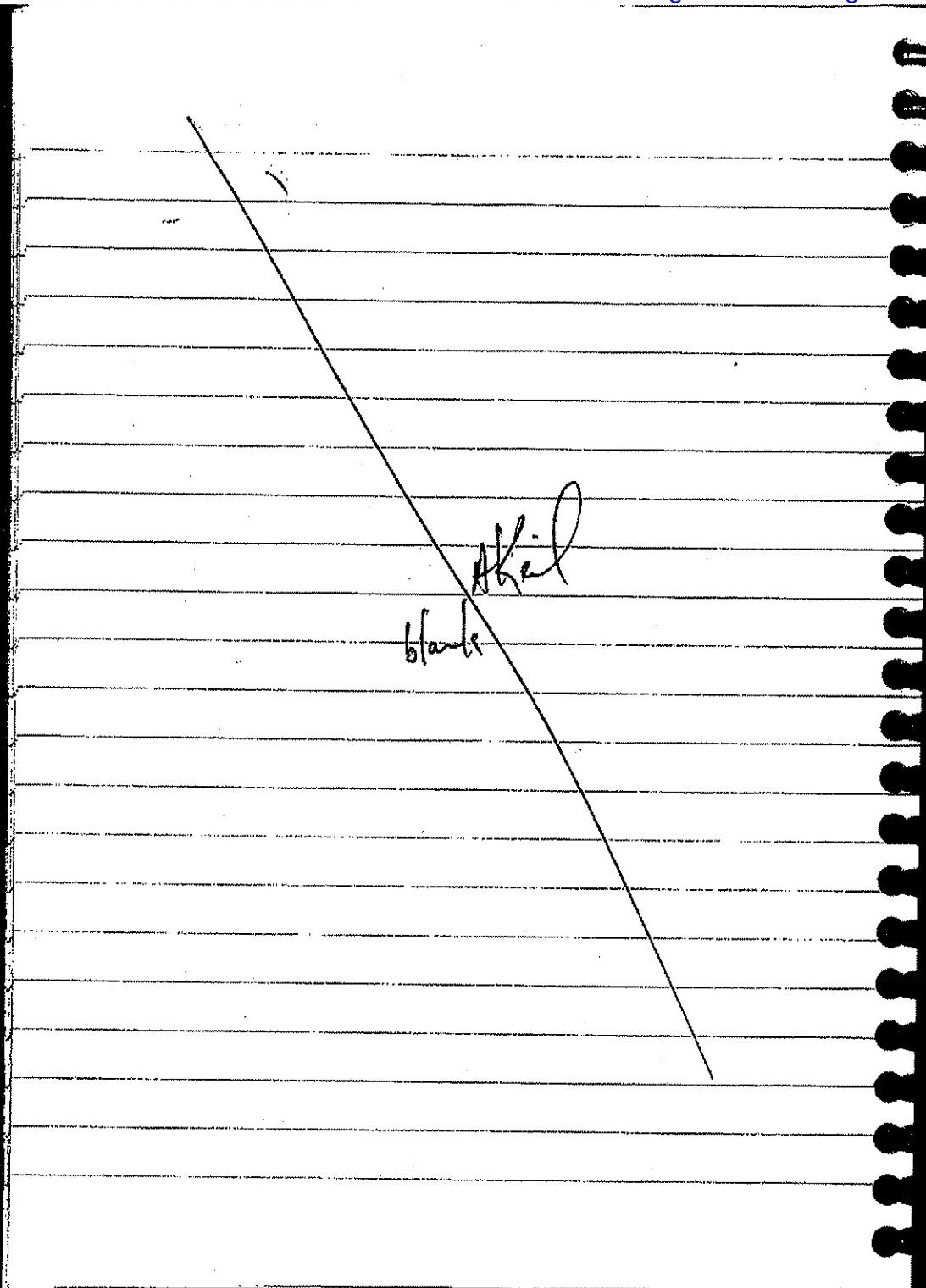
37 LW stock w/o benzene
powered @ 2:10

38 2 mL DL 5 ppm benzene
from cyl.

39 "

40 "

Akil



6/10

file 1 5 ppm benzene
AC 2 m.L

file 2 "

file 3 "

file 4 cyl. air blank

(some leftover benzene signal
at start)

file 5 cyl air blank

clean all the way

file 6 "

these were without filtered stalkless

filter hot^{1/2}

inlet filter at 82°C now

file 7 is 5mL benzene
+ethyl benzene (7mL) + toluene ^{1/2}
in G.B.TEC m-xylenes (9mL)

cap off @ 1:47

dump @ 1:51

After

6/10

Received ~~25~~⁴⁴ 230 ppm ($\pm 2\%$) benzene
cylinder from Argus Group
1000 psi, 103L

file 8 cyl. air blank

(some carry over in first 10 s)

file 9 cyl. air blank

clean

file 10 cyl. air blank

file 11-15 230 ppm Benzene
from cyl.

17-21
files 16-20 are 230 ppm benzene
set to 0.3 LPM, air at
1.2 LPM

From yesterday that's $\frac{1.086}{3} \cdot 230 \text{ ppm}$
 $\Rightarrow 49.95 \text{ ppm}$

(file 16 junk)

file 17 or 18 may have carryover...

AJF

13
09

6/10

MS states written at 11:07 AM 6/10

plate voltage 1245

mult bias 1300

file 22-24 cyl. blanks

file 25 room background

file 26 GBTEC background

file 27 20 ml benzene

cap off 1:47

poured 1:51

file 28 room air background

(some carryover in first few seconds) ^{> 40, ignore}

file 29 GBTEC background

file 30 is junk... false start

file 31 is GBTEC, 20ml benzene

1:47 uncapped trial 2

1:51 poured

AJG

6/10

file 32 GBTEC sampling for fun

file 33 room background 2 min

file 34 GBTEC bkgnd sample 2mL

file 35 GBTEC 20 mL benzene

cap off @ 1:47 trial 3

pour @ 1:51

file 36 room air background

some benzene carryover - L

first 10 sec

file 37 GBTEC signal @ elevated
flow

file 38 20 mL benzene w/ higher
flow

uncap @ 1:47

pour @ 1:51

NJ

6/10

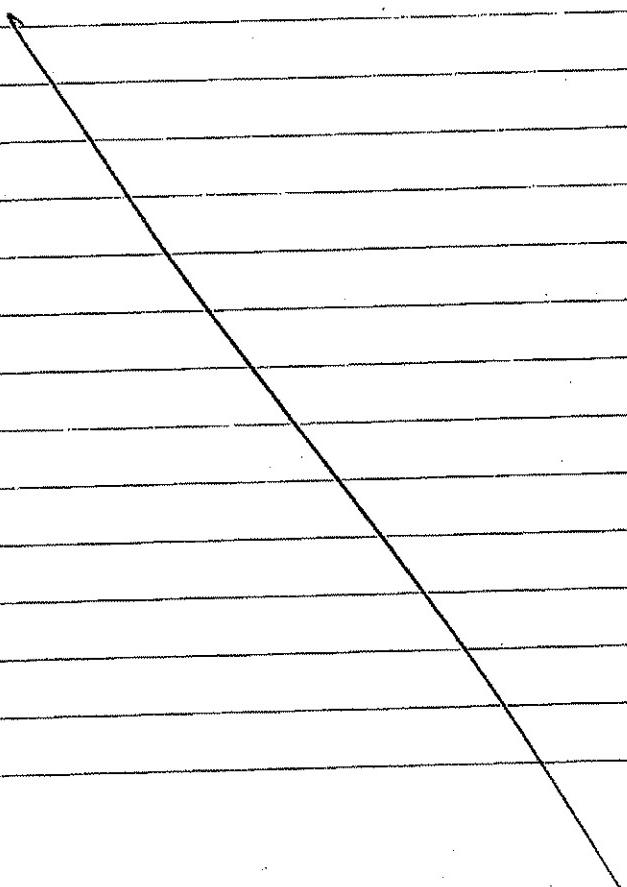
Fls 39, 40, 41

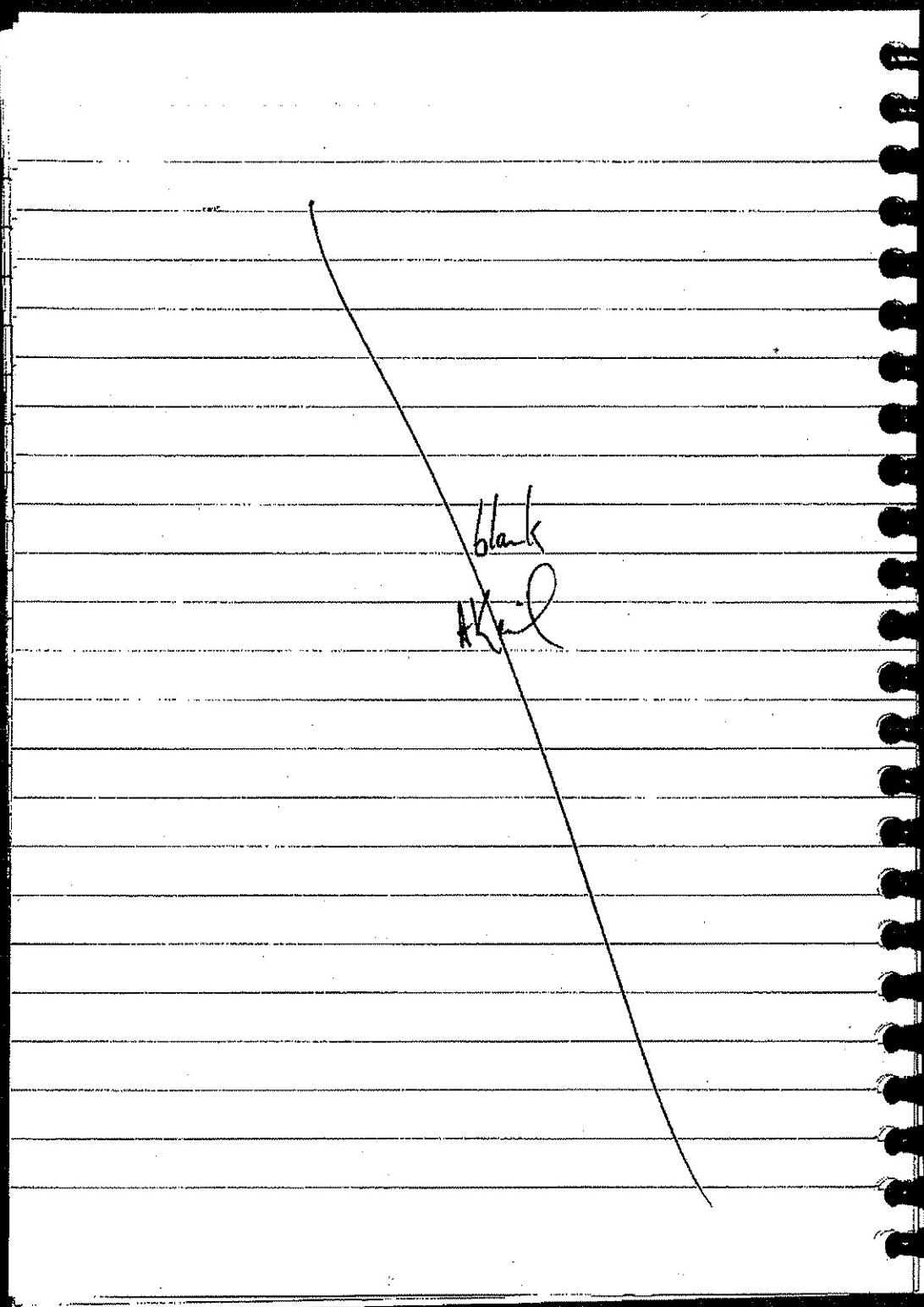
cyl. air blank

Part 0.3 ml of fls 39 is me

turning on the air - ignore data

AKM





6/11

low m/z tune to start day

files 1-3 cyl. air blanks, 2ml

(ignore 1st ~20s in file 1, leftover
m/z calibrant, etc.)

Ignore file 3 - I turned off air in middle of it

left heat tape on all last night,
so the ss filter is still at $\approx 95^{\circ}\text{C}$

file 4 cyl. air blank

^{5-7 AK}
files 5-8 5ppm benzene
from cylinder

files 8-10 are 49.95 ppm benzene
aka files 17-21 from yesterday
first ~20s of file 8 has some
carryover

files 11-13 are cylinder air
blanks

A/K

6/11

file 14 room air blank

file 15 ^{AK} GBTEC blank

file 16 LW,L GBTEC

20 mL

cap off @ 1:47

pour @ 1:51

file 17 cyl. air blank

file 18

18 ms to fixed ionization
time room air blank

file 19

18 ms fixed ion's time
6 ppm benzene

file 20

18 ms fixed ionization time

50 ppm benzene

8:32
8:30
Abel

6/11

file 21

18 ms room air blank

F = 22 or so

file 22

room air blank, ALC on, the
whole 6.7

file 23 GBTEC blank

file 24 - junk / restart / false start

file 25 GBTEC run with

LW mixture Trial 2 Flow 25.67 Lpm
ave

file 26 HEADSPACE of residue

from Day 2 Trial 1 glass plate

room air to 0.6 mL

0.6 min, inserted shkt into vial

containing ~1 mL of residue

1.2 mL, removed shkt

AKeal

6/14

file 27 room air blank

file 28 GBTEC blank

file 29

Trial 3 LW mixture

cap off Q 1:55 + 1:47 AK

purge Q 1:55

file 30

HEADSPACE of Trial 3 residue

room air until 0.6 ml/h,

then headspace until 1.5 ml/h

certainly volatiles present

file 31

5 ml of headspace of trial 3
residue

Q room air until 1 ml/h

then headspace vapors until 2.1 ml/h

room air 2.1 min - 3.0 ml/h

headspace 3.0 ml/h - 4.0 ml/h

room air 4.0 ml/h - end

6/11

Conference call w/ ?

Pete Drivas, John, Dale + Me at EPI

Pete discussing the testling so far

Benzene, CW

evaporation rates - reports $\frac{1}{2}$ life of

about 3 minutes, that, agrees well

with his theory

call w/ Dale next week to see

how are new numbers during Petys report +

file 32

Raw, detailed data of
residue (Trial 3 CW) headspace

however, what's labelled

as zero air in this file isn't -

it's nothing - forgot to turn on
cylinder

file 33 room air blank

file 34 GBTEC blank

i/Kel

6/11

file 35

W in GBTEC

higher flow

~52 fpm flow

cap off @ 1:49

start at 1:56

air velocity 26.0 fpm AK

file 36

GBTEC blank

file 37

1mL benzene +
19mL cyclohexane

file 38

SIM on 78, DL, 5 mL ^{10 AK}

0 - 2.2 230 ppm

3.6 - 5.2 5 ppm

5.2 - 6.6 zero air

6.8 - 9.2 50 ppm

9.2 - end zero air

Arial

6/11

file 39

alternate between

SIM for 78

and full scan 50-150

GBTEC blank

file 40

3 mL benzene

3 mL cyclohexane

in GBTEC

using alternating scans

①

file 41

2 mL benzene

6 mL cyclohexane

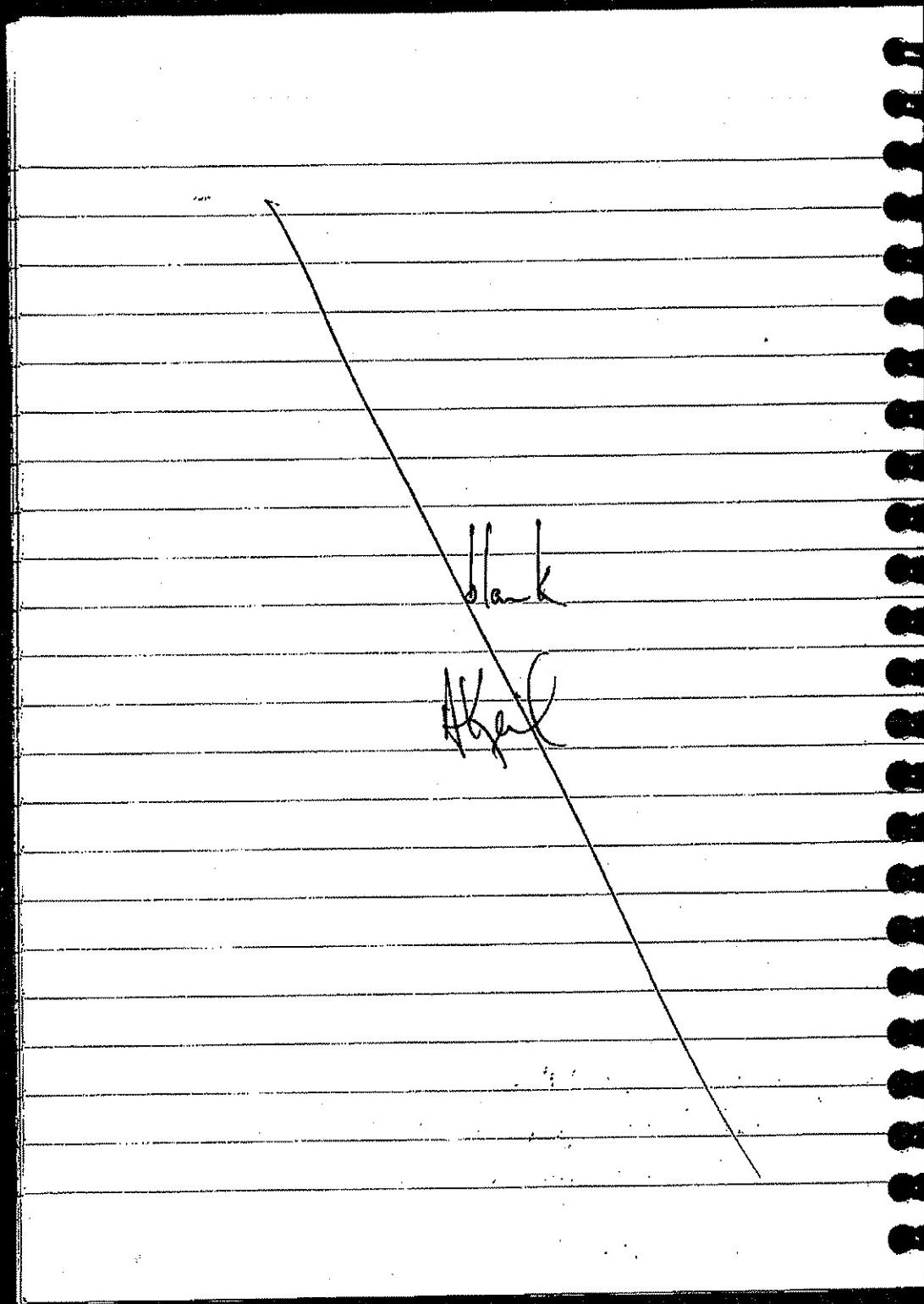
in GBTEC

file 42

9 mL cyclohexane

1 mL benzene

Khal



EPI00145

4/12

tune low m/z
file 1 - junk

files 2-4 cyl. air blanks
2 mL DL

files 5-7 5 ppm benzene

files 8-10 are 49.95 ppm
aka file 17 from 6/10

file 11 is junk

file 12

6 mL benzene

3 mL cyclohexane

in GBTEC

file 13 GBTEC run

19.5 mL cyclohexane

0.5 mL benzene

fkal

6/12

so for the benzene/cyclohexane
mixtures, we have:

p.LC 37 6/11 19:1

p.LC 12 6/12 3:4

p.LC 41 6/11 6:2

3:5

6/10 6:1

GBTEC + runs from 6/10

p.LC 42 6/11 9:1

p.LC 13 6/12 19.5:0.5

Air Veloc. by Summary Data so far from Alaska

(ft/min)

Trials	Day 1 6/10	Day 2 6/11
1	27.63	28.88
2	26.86	25.07
3	27.50	26.34
4	48.88	51.94

4/12

file 14 room air blank 1L, 2mL

file 15 GBTEC blank

file 16

working w/ liquid wrench
on rusty bolts Trial 1

first pour (only a portion)
of the liquid) at 3:05

all poured out by 4:45
at 20 mL, flask shook the
gloves around after having let them
sit for several minutes

file 17 room air blank

file 18 GBTEC blank w/ parts

file 19 Trial 2 - LW on parts

first pour @ 2:05

another pour @ 3:30

file 20 room air blank

file 21 GBTEC blank w/ parts

file 22 LW on parts trial 3.

glove shaking just after
15 mL

file 23 room air blank

file 24 GBTEC blank w/ parts

file 25 GBTEC LW w/ parts trial 4
simulation of shaking gloves

Support Document 15

EMSL Plate Glass Residual Oil Analysis

Asbestos • Lead • Environmental • Materials & Indoor Air Analysis

EMSL Analytical, Inc.

<http://www.emsl.com>



3 Cooper St.
Westmont, NJ 08108
Phone: (856) 858-4800
Fax: 8568584571

Attn: **Dale Johnson**
Environmental Profiles, Inc.
8805 Columbia 100 Parkway
Suite 100
Columbia, MD 21045

Phone (410) 744-0700
Fax: (410) 744-2003

7/6/2009

The following report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 7/2/2009. The results are tabulated on the attached data pages for the following client designated project:

Project ID: 29125

The reference number for these samples is EMSL Order #010903277. Please use this reference when calling about these samples.

If you have any questions, please do not hesitate to contact me at (856) 858-4800.

Reviewed and Approved By:

Julie Smith - Laboratory Director or
other approved signatory
NJ-NELAP Accredited:04653



The test results contained within this report meet the requirements of NELAC and/or the specific certification program that is applicable, unless otherwise noted.



EMSL Analytical, Inc.
3 Cooper St., Westmont, NJ 08108

Phone: (866) 858-4800 Fax: (866) 858-4571 Email: jsmith@emsl.com



SM

Attn: **Dale Johnson**
Environmental Profiles, Inc.
8805 Columbia 100 Parkway
Suite 100
Columbia, MD 21045

Customer ID: ENPI53
Customer PO:
Received: 07/02/09 11:16 AM
EMSL Order: 010903277

Fax: (410) 744-2003 Phone: (410) 744-0700 EMSL Proj: 29125

<i>Client Sample Description</i>		RES-oil-1 Plate Residue day 2, Trial 3	<i>Collected:</i>	7/1/2009	<i>Lab ID:</i>	0001
<i>Method</i>	<i>Parameter</i>		<i>Concentration</i>	<i>Reporting Limit Units</i>	<i>Analysis Date</i>	<i>Analyst</i>
8260B-Volatiles	See Attached			N/A	7/2/2009	afalasca
Reporting limits elevated due to low volume received.						
<i>Client Sample Description</i>		RES-oil-2 Plate Residue day 2, Trial 4	<i>Collected:</i>	7/1/2009	<i>Lab ID:</i>	0002
<i>Method</i>	<i>Parameter</i>		<i>Concentration</i>	<i>Reporting Limit Units</i>	<i>Analysis Date</i>	<i>Analyst</i>
8260B-Volatiles	See Attached			N/A	7/2/2009	afalasca
Reporting limits elevated due to low volume received.						
<i>Client Sample Description</i>		RES-oil-3 Plate Residue 6152009	<i>Collected:</i>	7/1/2009	<i>Lab ID:</i>	0003
<i>Method</i>	<i>Parameter</i>		<i>Concentration</i>	<i>Reporting Limit Units</i>	<i>Analysis Date</i>	<i>Analyst</i>
8260B-Volatiles	See Attached			N/A	7/2/2009	afalasca
Reporting limits elevated due to low volume received.						

EPI00152

EMSL Analytical Inc.**VOLATILE ORGANICS ANALYSIS DATA SHEET**

		Customer Sample#:	RES-oil-1	
Lab Name:	EMSL ANALYTICAL	Project:	29125	
EMSL Sample ID:	010903277-0001	Sample Matrix:	Organic	
Lab File ID:	V15732.D	Sampling Date:	7/1/2009	
Instrument ID:	VOA MSD-V	Analysis Date	7/2/2009 9:46:00 PM	
Analyst:	AF	Level (low/med):	MED	
GC Column:	RTX-VMS X 30m (0.25 mm)	Nominal Amount:	100 µL	
Sample wt/vol:	1 G	Aliquot Analyzed:	1 (µL)	
Extract Vol.	10000 (µL)	Method:	SW846 8260B	
Dilution Factor:	1	Moisture(%):		
Sample Container:	Jar (SW-846 5035)			
Heated Purge (Y/N):	N			
CAS NO	COMPOUND	Report Limit (µg/Kg)	CONC. (µg/Kg)	Q
71-43-2	Benzene	25000		U
Qualifier Definitions U = Undetected B = Compound detected in method blank E = Estimated value J = Estimated concentration. D = Dilution				

EMSL Analytical Inc.**VOLATILE ORGANICS ANALYSIS DATA SHEET**

		Customer Sample#: RES-oil-2		
Lab Name:	EMSL ANALYTICAL			
EMSL Sample ID:	010903277-0002	Project:	29125	
Lab File ID:	V15733.D	Sample Matrix:	Organic	
Instrument ID:	VOA MSD-V	Sampling Date:	7/1/2009	
Analyst:	AF	Analysis Date	7/2/2009 10:14:00 PM	
GC Column:	RTX-VMS X 30m (0.25 mm)	Level (low/med):	MED	
Sample wt/vol:	0.720 G	Nominal Amount:	100 µL	
Extract Vol.	10000 (µl)	Aliquot Analyzed:	1 (µl)	
Dilution Factor:	1	Method:	SW846 8260B	
Sample Container:	Jar (SW-846 5035)	Moisture(%)		
Heated Purge (Y/N):	N			
CAS NO	COMPOUND	Report Limit (µg/Kg)	CONC. (µg/Kg)	Q
71-43-2	Benzene	35000		U
Qualifier Definitions U = Undetected B = Compound detected in method blank E = Estimated value J = Estimated concentration. D = Dilution				

EMSL Analytical Inc.**VOLATILE ORGANICS ANALYSIS DATA SHEET**

		Customer Sample#:	RES-oil-3	
Lab Name:	EMSL ANALYTICAL	Project:	29125	
EMSL Sample ID:	010903277-0003	Sample Matrix:	Organic	
Lab File ID:	V15734.D	Sampling Date:	7/1/2009	
Instrument ID:	VOA MSD-V	Analysis Date	7/2/2009 10:41:00 PM	
Analyst:	AF	Level (low/med):	MED	
GC Column:	RTX-VMS X 30m (0.25 mm)	Nominal Amount:	100 µL	
Sample wt/vol:	0.920 G	Aliquot Analyzed:	1 (µL)	
Extract Vol.	10000 (µL)	Method:	SW846 8260B	
Dilution Factor:	1	Moisture(%)		
Sample Container:	Jar (SW-846 5035)			
Heated Purge (Y/N):	N			
CAS NO	COMPOUND	Report Limit (µg/Kg)	CONC. (µg/Kg)	Q
71-43-2	Benzene	27000		U
Qualifier Definitions U = Undetected B = Compound detected in method blank E = Estimated value J = Estimated concentration. D = Dilution				



107 Haddon Avenue, Westmont, New Jersey 08108

1-800-220-3675

http://www.emsl.com

010903277

EMSL ANALYTICAL, Inc.**CHAIN OF CUSTODY**

EMSL Rep:

09 JUL - 2 AM 11:16

e²
Third Party Billing requires written
authorization from third party

Your Name:

Dale Johnson

Company:

Environmental Profiles, Inc.

Street:

8805 Columbia 100 Parkway

Box #:

Suite 100

City/State:

Columbia, MD Zip 21045

EMSL-Bill to:

same address

Street:

Box #:

City/State:

Zip

Phone Results to:

Fax Results to:

Name:

Name:

Telephone #:

Dale Johnson

Fax #:

410-744-0700

Dale Johnson

410-744-2003

Project Name/Number:

Purchase Order #:

29125

TURNAROUND TIME

<input type="checkbox"/> 3 Hours	<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 12 Hours	<input type="checkbox"/> 24 Hours	<input checked="" type="checkbox"/> 48 Hours	<input type="checkbox"/> 72 Hours	<input type="checkbox"/> 4 Days	<input type="checkbox"/> 5 Days	<input type="checkbox"/> 6-10 Days
----------------------------------	----------------------------------	-----------------------------------	-----------------------------------	--	-----------------------------------	---------------------------------	---------------------------------	------------------------------------

SAMPLE MATRIX

<input type="checkbox"/> Air	<input checked="" type="checkbox"/> Bulk	<input type="checkbox"/> Soil	<input type="checkbox"/> Wipe	<input type="checkbox"/> Micro-Vac	<input type="checkbox"/> Drinking Water	<input type="checkbox"/> Wastewater	<input type="checkbox"/> Chips	<input type="checkbox"/> Other
------------------------------	--	-------------------------------	-------------------------------	------------------------------------	---	-------------------------------------	--------------------------------	--------------------------------

ASBESTOS ANALYSIS**PCM - Air**

- NIOSH 7400 (A) Issue 2: August 1994
- OSHA w/TWA

TEM AIR

- AHERA 40 CFR, Part 763 Subpart E
- NIOSH 7402 Issue 2

EPA Level II**PLM - Bulk**

- EPA 600/R-93/116
- NY Stratified Point Count
- California Air Resource Board (CARB) 435
- NIOSH 9002
- PLM NOB (Gravimetric) NYS 198.1
- EPA Point Count (400 Points)
- EPA Point Count (1,000 Points)
- Standard Addition Point Count

SOILS

- EPA Protocol Qualitative
- EPA Protocol Quantitative
- EMSL MSD 9000 Method fibers/gram
- Superfund EPA 540-R-097-028 (dust generation)

TEM BULK

- Drop Mount (Qualitative)
- Chatfield SOP-1988-02

TEM MICROVAC

- ASTM D 5755-93 (Quantitative)

TEM WIPE

- ASTM D-6480-99

Qualitative**TEM WATER**

- EPA 100.1

- EPA 100.2

- NYS 198.2

OTHER:**LEAD ANALYSIS****Flame Atomic Absorption**

- Wipe, SW846-7420
- Soil, SW846-7420
- Air, NIOSH 7082
- Chips, SW846-7420 or AOAC 5.009 (974.02)
- Wastewater, SW 846-7420
- TCLP LEAD SW846-1311/7420

Graphite Furnace Atomic Absorption

- Air, NIOSH 7103
- Wastewater, SW846-7421
- Soil, SW846-7421
- Drinking Water, EPA 239.2

ICP – Inductively Coupled Plasma

- Wipe, SW846-6010
- Soil, SW846-6010
- Air, NIOSH 7300

MATERIALS ANALYSIS

- Full Particle Identification
- Optical Particle Identification
- Dust Mites and Insect Fragments
- Particle Size & Distribution
- Product Comparison
- Paint Characterization
- Failure Analysis
- Corrosion Analysis
- Glove Box Containment Study
- Petrographic Examination of Concrete
- Portland Cement in Workplace Atmospheres (OSHA ID-143)
- Man Made Vitreous Fibers - MMVF's
- Synthetic Fiber Identification
- Other: Benzene in oil + headspace

MICROBIAL ANALYSIS**Air Samples**

- Mold & Fungi by Air O Cell
- Mold & Fungi by Agar Plate count & ID
- Bacterial Count and Gram Stain
- Bacterial Count and Identification

Water Samples

- Total Coliforms, Fecal Coliforms
- Escherichia-Coli, Fecal Streptococcus
- Legionella
- Salmonella
- Giardia and Cryptosporidium

Wipe and Bulk Samples

- Mold & Fungi – Direct Examination
- Mold & Fungi – (Culture follow up to direct examination if necessary)
- Mold & Fungi – Culture (Count & ID)
- Mold & Fungi – Culture (Count only)
- Bacterial Count & Gram Stain
- Bacterial Count & Identification (3 most prominent types)
- Other:

IAQ ANALYSIS

- Nuisance Dust (NIOSH 0500 & 0600)
- Airborne Dust (PM10, TSP)
- Silica Analysis by XRD
- Niosh 7500
- HVAC Efficiency
- Carbon Black
- Airborne Oil Mist
- Other:

Client Sample # (S)

RES-OIL-(1-3) three samples

TOTAL SAMPLE # 3

Relinquished:

Dale Johnson

Date: 2/11/2009

Time: 4:00 pm

Received:

Amy Graham

Date: 7/2/09

Time:

Relinquished:

Date:

Time:

Received:

Date:

Time:

Page 1 of 2



107 Haddon Avenue, Westmont, New Jersey 08108

1-800-220-3675

<http://www.emsl.com>

SAMPLE NUMBER	SAMPLE DESCRIPTION/LOCATION	VOLUME AIR (L)	AREA (INCHES SQ.)
RES-OIL-1	Plate residue Day 2, Trial 3	Bulk Liquid	
RES-OIL-2	Plate residue Day 2, Trial 4	Bulk Liquid	
RES-OIL-3	Plate residue 6/15/2009	Bulk Liquid	
<i>SAMPLE 1/1 PER VIAL</i>			
<i>AKG/BK</i>			
		60	
		JULY	
		1	
		20	
		30	
		40	
		50	
		60	
		70	
		80	
		90	
		100	
		110	
		120	
		130	
		140	
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		970	
		980	
		990	
		1000	

Relinquished:
Received:
Relinquished:
Received:

Dale Johnson

Date: 2/1/2009 Time: 4:00 pm
 Date: _____ Time: _____
 Date: _____ Time: _____
 Date: _____ Time: _____